

## YAG AEROSOL LIDAR

by

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The Global Atmospheric Backscatter Experiment (GLOBE) Mission, using the NASA DC-8 aircraft platform, is designed to provide the magnitude and statistical distribution of atmospheric backscatter cross section at lidar operating wavelengths. This is a fundamental parameter required for the Doppler lidar proposed to be used on a spacecraft platform for global wind field measurements. The prime measurements will be made by a CO<sub>2</sub> lidar instrument in the 9 - 10 um range. These measurements will be complemented with the Goddard YAG Aerosol Lidar (YAL) data in two wavelengths, 0.532 um and 1.06 um, in the visible and near-infrared. The GLOBE experiment will be conducted over the Pacific Basin where there is great interest in the backscatter from clean, remote air masses.

The YAL, being a new activity, is being designed to utilize as much existing hardware, as feasible, to minimize cost and reduce implementation time. The instrument utilizes a 16-inch telescope which is mounted vertically and can be rotated for either an uplooking or a downlooking port. This provides aerosol data acquisition from the nadir position or aerosol data and in-flight calibration data in the zenith position.

The laser, energy monitor, telescope and detector package will be mounted on an optical breadboard. The optical breadboard is mounted through isolation mounts between two low boy racks.

The detector package will utilize a photomultiplier tube for the 0.532 um channel and a silicon avalanche photo detector (APD) for the 1.06 um channel.

The data acquisition system is being developed by using a desk top PC 386 with a CAMAC crate. The data storage will be provided on an optical disk with a tape back-up system. The data acquisition system will be located in a separate electronic rack.

Purchase Orders have been initiated for all major components. Some of the items have been received. Design drawings are in progress for fabrication of mounting hardware for the optics, telescope, energy monitor, and detector package.

Integration of the instrument into the DC-8 and the flight mission is being scheduled for the Spring of 1989.

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